

INVASIVE PLANT MANAGEMENT REPORT: SENEY NATIONAL WILDLIFE REFUGE (2016)

Greg Corace-Applied Sciences Program*
Lyndsay Morrison-Applied Sciences Program

ACKNOWLEDGEMENTS

Special thanks to the Applied Sciences Program interns: Tayelor Gosselin and Lyndsay Morrison. Jim Patton took lead on the design of a paddle boat that, unfortunately, did not work out well due to its need for higher water levels. Gary Lindsay took lead on “Marsh Master” operation. A Michigan Department of Natural Resources grant through the Central Upper Peninsula Cooperative Weed Management Area and the Alger County Conservation District provided funds for this work, administered by Seney Natural History Association.

INTRODUCTION

Invasive plant species management is a priority for Seney National Wildlife Refuge (NWR or refuge) (Table 1). Past inventories have found a number of invasive plant species within the refuge (see 2013 *Habitat Management Plan* and *Pest Management Plan* included in its appendix). Of these, a primary species requiring management is glossy buckthorn (*Frangula alnus*, hereafter FRAL). A species native to Eurasia, FRAL was introduced to North America in the late nineteenth century (Voss 1985). FRAL leaves are 0.5 – 2.8 inches long, alternate, simple, ovate and deeply veined. The tops of the leaves are light to dark green, with a slight gloss and a lighter green below; identification of FRAL is easiest in the fall because it retains green foliage longer than native plant species (Heidorn 1990). Flowering occurs from May to June. Fruit forms in drupes in July and last through September (Barnes 1981). Initially, the berries are yellow-green, but ripen to red, then to black as the season progresses. The bark of FRAL ranges from reddish-green in younger plants to a darker grey-green in more mature plants. When cut, FRAL can be differentiated from other shrubs by its distinctive yellow sapwood. The entire shrub may grow up to 22 feet, with many stems branching from the base. In older shrubs, base stems can be as large as 10 inches in diameter (Heidorn 1990). FRAL’s rapid growth and ability to grow densely were characteristics originally thought to be ideal for use as hedgerows and for other landscaping purposes. At Seney NWR, these same characteristics lead to FRAL homogenizing wetland by outcompeting native shrubs.

Table 1. Invasive plant species of management priority and management actions by month (see 2013 *Habitat Management Plan* for more information on management and the autoecology of the listed plant species).

Management Action and Plant Species	Month						
	April	May	June	July	August	September	October
Planning	X						X
Forget-Me-Not (spraying)		X	X				
Leafy Spurge (spraying)		X	X	X			
Glossy Buckthorn (spraying)				X	X	X	
Multiflora Rose (spraying)				X	X	X	
Tartarian Honesuckle (spraying)				X	X	X	
Purple Loosestrife (spraying)				X	X		
Spotted Knapweed (spraying at Whitefish Point)					X	X	
General Roadside Species (mowing)			X	X			
Reporting							X

FRAL was first documented in Michigan in Delta County in 1934 (Voss 1985). Based on the age of previously cut stems, the arrival of FRAL at Seney NWR may have occurred in the 1940's or early 1950's. A survey conducted by McNeil et al. (1999) indicated that FRAL was present and widespread in Unit 1 and on adjacent Michigan Department of Natural Resources (MDNR) lands. Further work has identified scattered areas of FRAL in Unit 2 (especially A-2, A-2 West, C-2, along the T-2 to M-2 Rd., scattered areas at Lower Goose Pen, Pine Creek Rd., and Driggs River Rd.) (Fig. 1).

In 2001 management began to reduce the extent and abundance of FRAL at the refuge. In 2004 the refuge conducted research to assess the efficacy of past treatments. Results indicated that stump treatments resulted in vigorous sprouting, and that future management should focus on foliar spraying using ~2.5% active ingredient (a.i.) glyphosate (*Rodeo*) from late July through September (Nagel et. al. 2008). Follow-up work by Corace et al. (2008) indicated that 1.5% a.i. *Rodeo* solution worked as well. *Rodeo* has been the chosen herbicide due to its approved use in wetlands and relatively low toxicity to other organisms. However, to increase the number of “tools” that can be used in invasive plant management at Seney NWR, DiAllesandro (2012) conducted a study that showed that ~2.5% a.i. solution of *Garlon 3A* can also be highly effective. Although some hand pulling and fire treatments have been done in the past, neither is highly effective at managing FRAL by themselves.

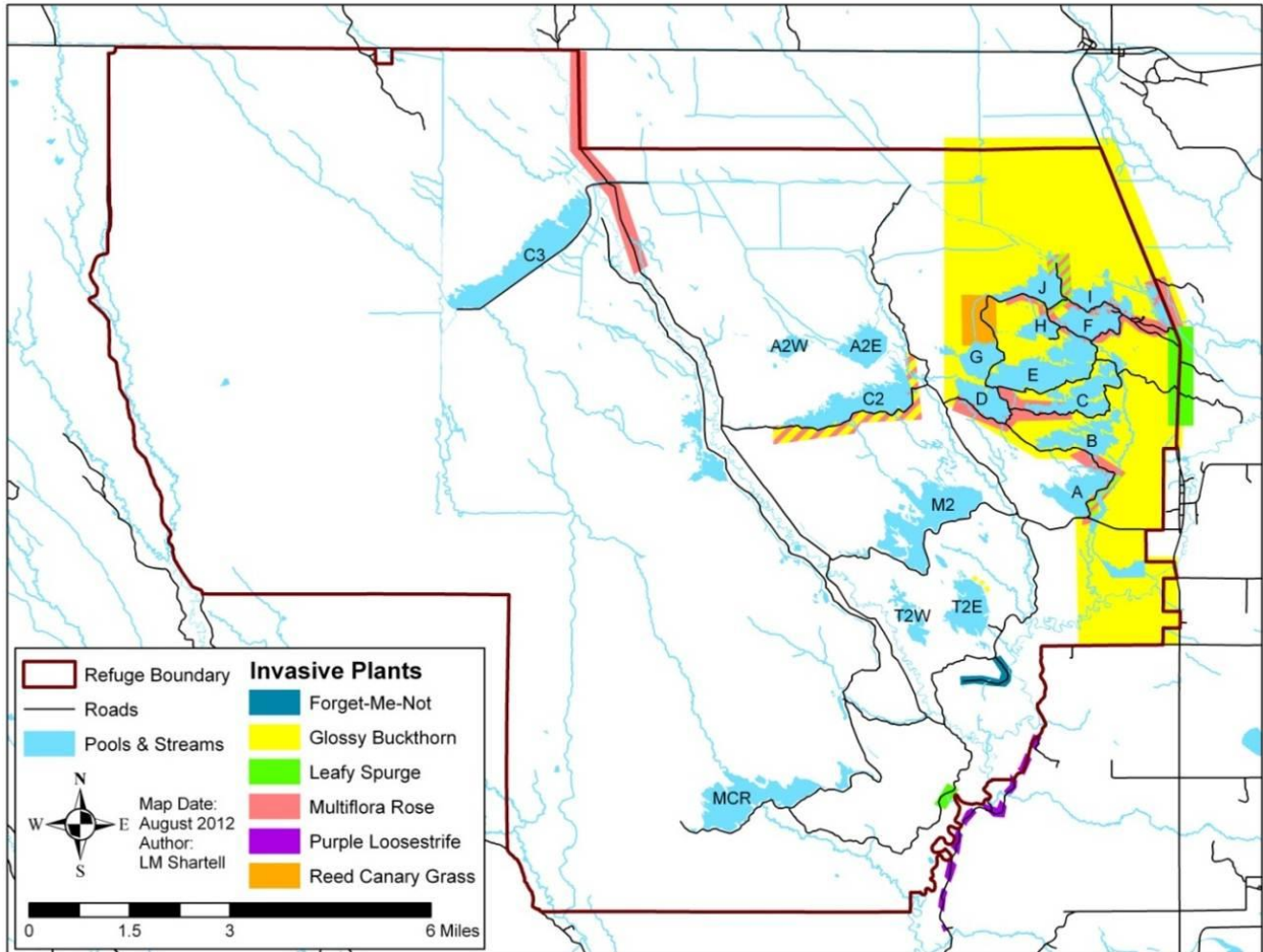


Figure 1. Known occurrences of managed invasive plant species at Seney NWR as of 2012. Locations are based on surveys, treatment data, miscellaneous observations, and other published and unpublished documents. Some species (e.g. leafy spurge, multiflora rose) are scattered within indicated areas, rather than covering the full area. Tartarian honeysuckle, not shown, occurs in isolated small patches at the Headquarters, Visitor Center, and along some edges of farm fields (i.e., Conlon, Smith, Sub-Headquarters). Also not shown are patches of leafy spurge on M-77 at North Entrance Rd., near the C-3 Pool gate, I-J Spillway, and along Robinson Rd. near the gravel piles at Sub-Headquarters. Some species (purple loosestrife and garlic mustard) have been detected and treated; these species come and go over time, but established populations are not known to exist. Recent evidence suggests that glossy buckthorn can be more accurately thought to be ~1/4 mi further west and is found from Pine Creek Rd., then east. Shapefiles of these data were given to the Midwest Invasive Species Network (MISN). Mixed colors mean that more than one invasive plant is found in that location.

METHODS

Major foci of management in 2016 were as follows:

- 1) to slowly switch over to predominately treating with a ~1.85 % active ingredient (a.i.) solution of *Garlon 3A* or *Element 3A*;
- 2) to do more treatment in places tough to reach, that were “out of the way” and identified in GPS locations in past years. This work also included canoe work on I and J and C-2 Pools as well as walking peninsulas that extend into wetlands and pools from dikes, and;
- 3) treat any new infestations or treatment areas or isolated outliers.

Based on a review of past invasive plant management reports, the following area outliers were treated:

- Lower Goose Pen Bridge at Smith Farm and along south dike of Lower Goose Pen Pool;
- Pine Creek Rd. points (N46.3070, W86.02164; N46.26359, W85.99976; N46.26275, W85.99855; N46.27740, W86.00652; N46.30657, W86.02205);
- Diversion Ditch points (N46.31638, W86.01175; N46.31647, W86.01198; N46.31645, W86.01346; N46.31651, W86.01402; N46.31652, W86.01452; N46.31632, W86.01540, N46.31652, W86.01694).
- Abandoned dike/water control structure south of Robinson Rd. and along 2-track through chained access (N46.23328, W86.23882);
- Southwest dike of A-1 Pool;
- South dike of A-2 West Pool and west dike of A-2 Pool;
- West dike of North Show Pool-South Show Pool to Nature Trail;
- Manistique River Rd. east of Conlon Farm;
- T-2 East Dike on east side along 2-track to M-2 Pool;
- North-south running dike between Boardwalk and trail to Show Pools off of Nature Trail;
- C2 Pool islands (4) to east: N46.27406, W86.01308; N46.27227, W86.01289; N46.27190, W86.01443; N46.27113, W86.01815.

Detailed instructions on the herbicide labels were followed regarding preparation and application (no surfactant was used). All dilutions were 1:24 yielding active ingredient concentrations of approximately 2.25% for *Rodeo* and 1.85% for *Element 3A* or *Garlon 3A*. Spraying devices included hand pumps and power sprayers attached to an all-terrain vehicle (ATV/UTV). Work was primarily conducted at Seney NWR, but also occurred at Whitefish Point Unit, on adjacent lands (Manistique River Rd., MDNR land east of M-77), and at Kirtland’s Warbler Wildlife Management Area (WMA) parcel in northern Clare Co. Inventory of invasive plants in the

Seney Wilderness Area was also completed as part of a Master's thesis in preparation at Northern Michigan University and re-mapping (using aerial photos to compliment past GPS work) was done at Whitefish Point.

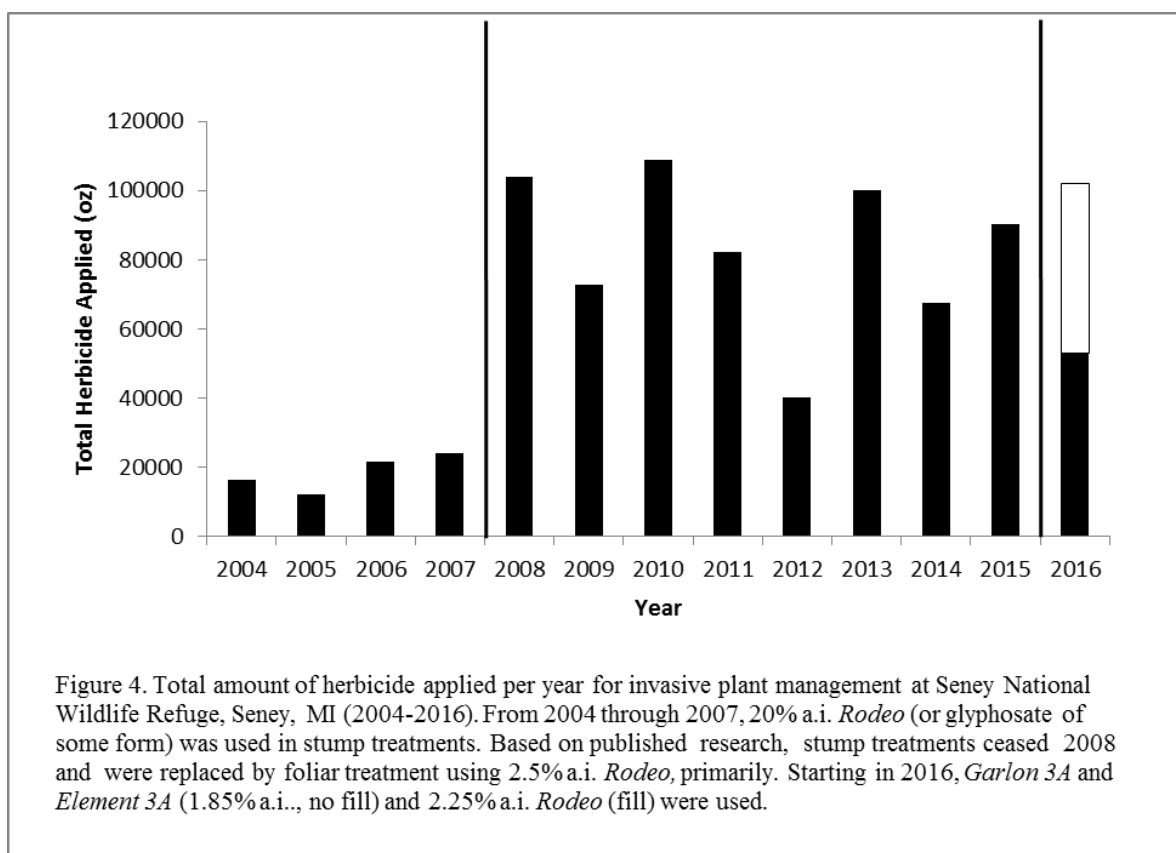
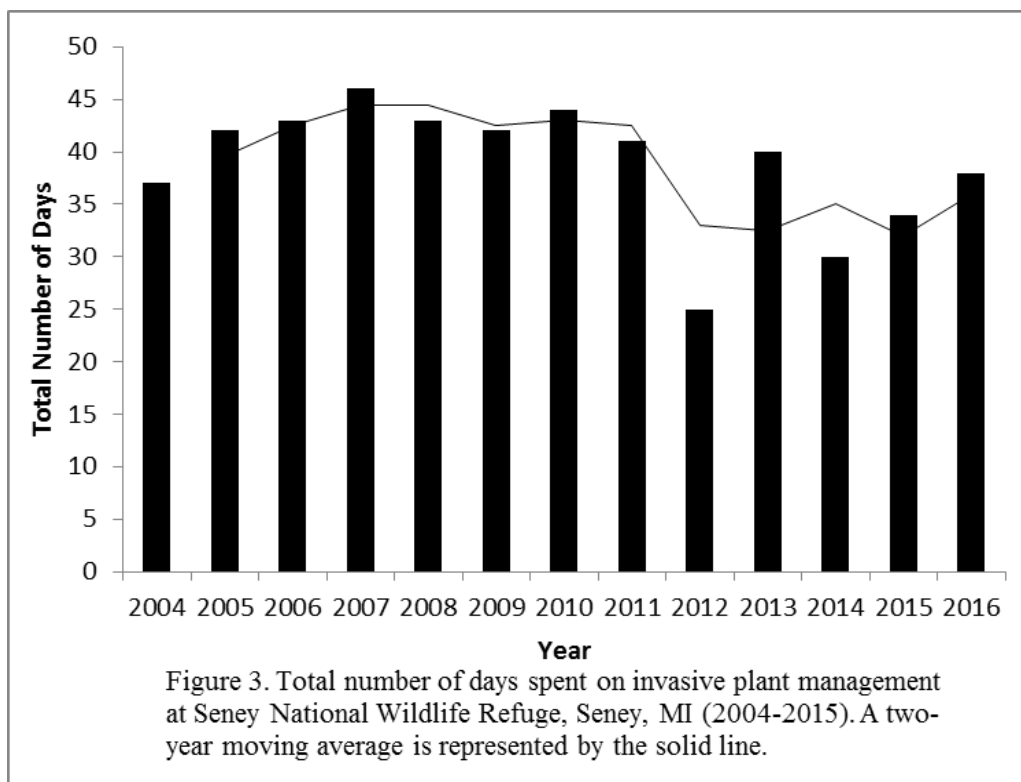
TREATMENT SUMMARY

Field treatments began on 1 June and ended on 25 August, with treatment occurring over 38 days. All priority species listed in Table 1 and Fig. 1 (above)-other than reed canary grass-were treated; it was quite difficult to find any live multiflora rose to treat in known locations. Leafy spurge was treated at Sub-Headquarters gate and C-3 Pool area. Forget-me-not was treated at River Road Quarters and Chicago Farm Field Rd. In the latter, more effort needs to be extended. Tartarian honeysuckle was sprayed near Headquarters and along south edge of Conlon Farm. Purple loosestrife was treated along Manistique River Rd., C Pool at C-B Spillway (Fig. 2; N46.26635, W85.95292; N46.26683, W85.95042), and at the Kirtland's Warbler WMA parcel in northwest Clare Co. (very little herbicide was necessary at either the first or third site, suggesting efficacy of management efforts so far). Spotted knapweed was treated at Whitefish Point. Leafy spurge and forget-me-not were treated at the few isolated patches at which they exist. Also treated was wild parsnip (*Pastinaca sativa*) along M-77. The rest of the efforts were expended on glossy buckthorn (FRAL).

A total of 52,992 ounces (414 gal) of 2.25% a.i. *Rodeo* was sprayed. A total of 49,152 ounces (384 gal) of 1.85% a.i. *Garlon 3A* or *Element 3A* was sprayed. The overall effort in invasive plant management, both in volume herbicide applied and number of treatment days, closely approximated long-term averages (Fig. 3, 4).



Figure 2. Applied Sciences Program Intern Lyndsay Morrison and a patch of purple loosestrife found by volunteers at C Pool at C-B Spillway, 2016.



LIST OF 2017 PRIORITIES

- Find, train, and hire a technician to work during the August-September spray period.
- Use *Garlon 3A* primarily, testing to see if 0.5:24.5 dilution ratio works.
- Spray inside edges of Unit 1 pools using a canoe (emphasize Show Pools, J Pool, F Pool, E Pool);
- Revisit all areas shown in Fig. 1 and in the Results section from this and previous years (e.g., Whitefish Point for spotted knapweed; Harbor Island NWR for *Phragmites*; C Pool, Clare Co. and Manistique River Rd./C-B Spillway, etc. for purple loosestrife; Driggs River Rd. at Diversion Farm for multiflora rose, misc. locations for leafy spurge, forget-me-not, etc.).
- At least two full days should be spent at Whitefish Point treating spotted knapweed using ATV/UTV, power sprayers, and hand pumps. This can be done after flowering (August-mid September).
- Revisit isolated FRAL at A-2 West, C-2 Pool islands, D Pool just SE of gate, swan observation platform on E Pool, along inside edge of C Pool, B Pool, T-2 to M-2 road, D Pool peninsula, to the west of Pine Creek Rd., at Lower Goose Pen (and the Smith Field bridge) and along A-2 and C-2 Pools (i.e., prioritize plants at boundary of distribution).
- The UTV and the 6-wheeler proved quite effective in treating FRAL on MDNR lands on the east side of M-77 and their use should continue in future years.
- Spray between Refuge Entrance Rd. and North Entrance Rd. and under M-77 powerlines.

LITERATURE CITED

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APPENDIX

Marsh Master Herbicide Work Protocol for Invasive Plant Management at Seney NWR

1. Setup & Cleanup:

Setup of the sprayer unit will be done by the Marsh Master operator with assistance from the sprayer/crewmember (staff of the Applied Sciences Program). The machine will be cleaned by the operator and crewmember/sprayer working together. It will be assumed that the machine will be cleaned and returned to a “fire-ready” state after each use on the day it is used. Cleaning will require a minimum of 1-1/2 hours and may require additional time. Time required to clean the machine is driven by the amount of mud and vegetation on the machine after spraying. Additionally, the invasive plants the machine is exposed to influence the amount of clean up time. On those occasions where the machine will be used to spray for several days in a row limited cleaning may be approved by the Fire Management Officer (FMO).

2. Work Duration:

There should be no less than 4 hours of work planned for any given day. This does not include setup, transport, or cleaning time. All work (setup and cleanup) should be planned for completion in a normal 9 or 8 hour work day.

3. Target Area Maps:

Maps will be provided to Marsh Master operator by Applied Sciences Lead as requested by operator if treatment areas change significantly. They will be full page (8-1/2”by 11”) in digital JPEG format with treatment areas clearly identified. Resolution should be sufficient to identify access points and potential hazards in treatment areas.

4. Machine Oversight:

Marsh Master operator is in charge until the work is complete. This is to include from setup to cleanup of the machine. Overall oversight of operations is by the Fire Management Officer and oversight of spraying locations, etc. by the Refuge Biologist.

5. Herbicide Clean Up:

Herbicide mixing, spraying, and cleanup is the responsibility of spray operator under the direction of Applied Sciences Program and shall include removal of unused herbicide from the slip-on sprayer unit used on the Marsh Master.



United States Department of the Interior
FISH AND WILDLIFE SERVICE
Seney National Wildlife Refuge
1674 Refuge Entrance Rd.
Seney, MI 49883
906.586.9851

Memorandum

Date: 21 August 2013

From: Applied Sciences Program (Greg Corace, Ecologist)

To: Visitor Services (Sara Giles, Manager and Jennifer McDonough, Ranger)

RE: Volunteers and Applied Sciences Program Activities (Invasive Plant Management)

The following outlines the agreement made today in which the volunteers (through Visitor Services) are to assist with the management of invasive plants on lands managed by Seney NWR. The overarching theme is that (as best as possible) accountability, timeliness, order, division of labor, safety, and efficiency be used in this agreement; our hope is to avoid confusion among staff and volunteers, ineffective work, and be as proactive as possible.

- The main use of volunteers will be twofold: 1) to assist with “early detection” of any new, non-native (potentially invasive) plant species or animals at the refuge and 2) to identify any changes to the known distribution of managed plant species (see plant species list and distribution map in *Pest Management Plan* which itself is found in the 2013 *Habitat Management Plan*).
- The main contact for volunteers will be Jen, with Sara to fill in as needed.
- Locations of new species or changes to distribution map will involve flagging the plant and recording its location using a GPS (decimal degrees, NAD83), whenever possible. This information will be forwarded to Greg by Jen (or Sara) and his staff will conduct “rapid response.”
- Specimens of new species should be collected (by Greg or Jen or someone else identified) and given to Jen for inclusion in the herbarium (per existing working agreement with Greg).
- Future considerations will be made to involve volunteers in the management of invasive plants, perhaps focusing on the pulling of glossy buckthorn seedlings within Unit 1 (“regular” volunteers will be expected to read the *Pest Management Plan*, with discussion and training to follow as needed)
- Gate keys will not be issued for this work. Either this work is done by walking or biking or is part of other, approved activities at the refuge.